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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/570,668

03/06/2006

Akihiko Endo

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EXAMINER

SMITH, BRADLEY

ART UNIT

PAPER NUMBER

2894

NOTIFICATION DATE

DELIVERY MODE

08/22/2008

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

gbpatent@gbpatent.com
pto@gbpatent.com

Office Action Summary	Application No. 10/570,668	Applicant(s) ENDO ET AL.	
	Examiner Bradley K. Smith	Art Unit 2894	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 May 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 18-35 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 18-35 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>5/7/08</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 18-35 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Specifically the specification does not disclose what is meant by "old ASTM". Page 7 lines 20-23, disclose "the term, old ASTM, used herein represents one of the definitions of the oxygen concentration in the silicon and one of the techniques for converting a FT-IR spectrum to an oxygen concentration". This definition would not enable one of ordinary skill in the art to make the current invention, because they would not know what the "old ASTM" comprises.

The applicant recently supplied an IDS statement disclosing Fumio SHIMURA, "Semiconductor and Silicon Crystal Technology", Academic Press, Inc., San Diego, New York, Berkeley, Boston, London, Sydney, Tokyo, Toronto, 1989, pp. ii-viii, 1,232-233, and 274-275. The reference discloses that "old ATSM" is known in the art. However this reference fails to clear up the fact that the applicant has not disclosed what "old ASTM" means. Is the "old ASTM" the old ASTM F121-1979 disclosed by Hourai or the old ASTM 1976 disclosed by Asayama? One of ordinary skill would need to know which factor to use when measuring/calculating the interstitial oxygen concentration.

Hourai et al. (US Patent 7,364,618) disclose old ASTM F121-1979 (see column 11 line 64).

Asayama et al. (US Patent 6,709,957) disclose old ASTM 1976 (see column 5 line 61).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 19, 23 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tamatsuka et al. (US 6,224,668) in view of Takase et al. (US 7,397,110 child of WO/2003/092065). Tamatsuka disclose bonding an active layer (2) to a support substrate (3) reducing the film thickness of the active layer (see figures 1a-1g). Regarding claim 4, Tamatsuka disclose ion implanting and heat treating to separate the layers (see column 9 lines 12-30). Tamatsuka disclose forming an SOI layer with a thickness of 1 micron *or less* (see abstract). Tamatsuka fails to disclose a the supporting wafer has an oxygen concentration of equal to or higher than 16×10^{17} atoms/cm³ when measured in accordance with old ASTM. However Takase disclose the supporting wafer has an oxygen concentration of equal to or higher than 14×10^{17} atoms/cm³ (see abstract) when measured in accordance with ASTM F121 1979. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Tamatsku in view of Takase because the oxygen concentration in the wafer of Takase has a gettering ability (see Takase abstract).

Allowable Subject Matter

Claims 18, 20-34 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 1st paragraph, set forth in this Office action.

The following is a statement of reasons for the indication of allowable subject matter: the prior art of record neither teaches nor suggests the supporting wafer has a nitrogen concentration in a range of 1×10^{14} atoms/cm³ to 3×10^{15} atoms/cm³ and an oxygen concentration of equal to or higher than 12×10^{17} atoms/cm³ when measured in accordance with old ASTM so as to have an oxidation induced stacking fault substantially entirely across a surface thereof (claims 18, 20, 22, 24, 26, 28, 30, 34) ion-implanting one of a hydrogen gas and a noble gas element to the active layer wafer to form an ion-implanted layer in the active layer wafer, prior to said bonding; and heat treating the bonded wafer body to induce cleavage in the bonded wafer at the site of the ion-implanted layer as an interface so as to form the SOI layer with a remaining active layer (claims 21, 25, 29, 33) applying a rapid thermal process at a temperature in a range of 1100 °C to 1250 °C for five minutes or longer to the supporting wafer in a reducing gas atmosphere, prior to said bonding; and applying a high-temperature heat treatment at a temperature in a range of 1050 °C to 1250 °C for one hour or longer to the supporting wafer in a reducing gas atmosphere, prior to said bonding (claims 27 and 31).

Response to Arguments

Applicant's arguments filed 5/7/08 have been fully considered but they are not persuasive. The applicant's contends that the Shimura reference discloses the meaning of "old ASTM" is known in the art. However the examiner has offered two references which disclose "old ASTM" with different years associated with the standard. Therefore the examiner does not understand which standard applicant is using in order to make the invention.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bradley K. Smith whose telephone number is 571-272-1884. The examiner can normally be reached on 10-6.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sue Purvis can be reached on 571-272-1236. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Bradley K Smith/
Primary Examiner, Art Unit 2894